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EFFECT OF *MORINDA LUCIDA LEAF* POWDER AS A NATURAL FEED ADDITIVES IN ANIMALS FOR MITIGATING ANTIBIOTIC RESIDUES IN THE ENVIROMENT: A SYSTEMATIC REVIEW

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INTRODUCTION & AIM

The extensive use of antibiotics in livestock production has led to the release of residues into soil, water, and agricultural ecosystems, contributing to antimicrobial resistance and environmental contamination. Sustainable alternatives that reduce antibiotic use are therefore urgently needed.

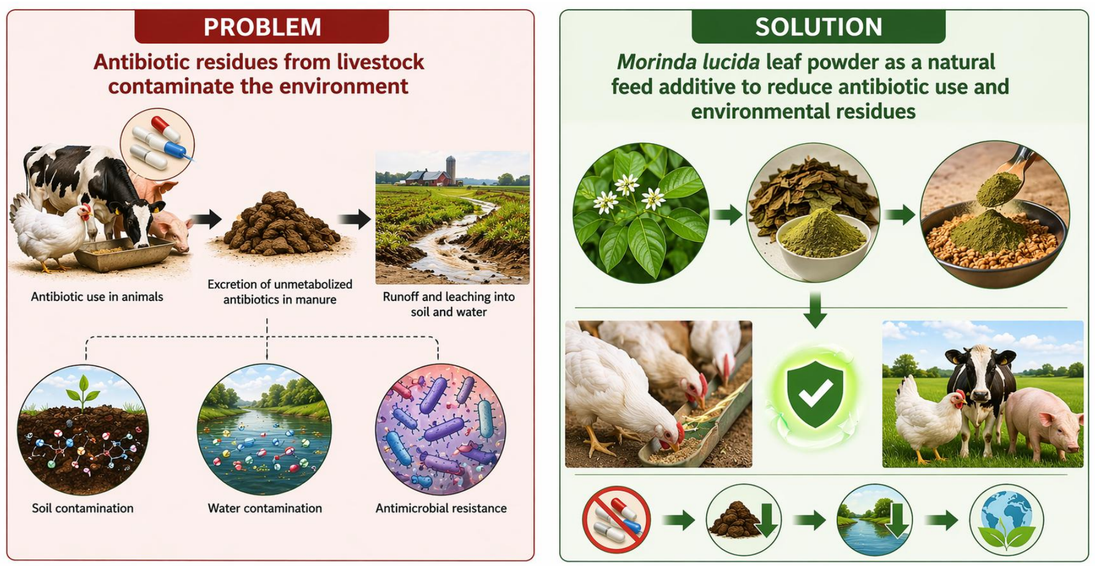

Fig.1: Diagram showing the pathway of antibiotic residues from animal use to environmental contamination and the mitigating role of Morinda lucida leaf powder in reducing antibiotic dependence and environmental pollution.

This systematic review evaluates the potential of Morinda lucida leaf powder to mitigate environmental antibiotic residues from livestock production.

METHOD

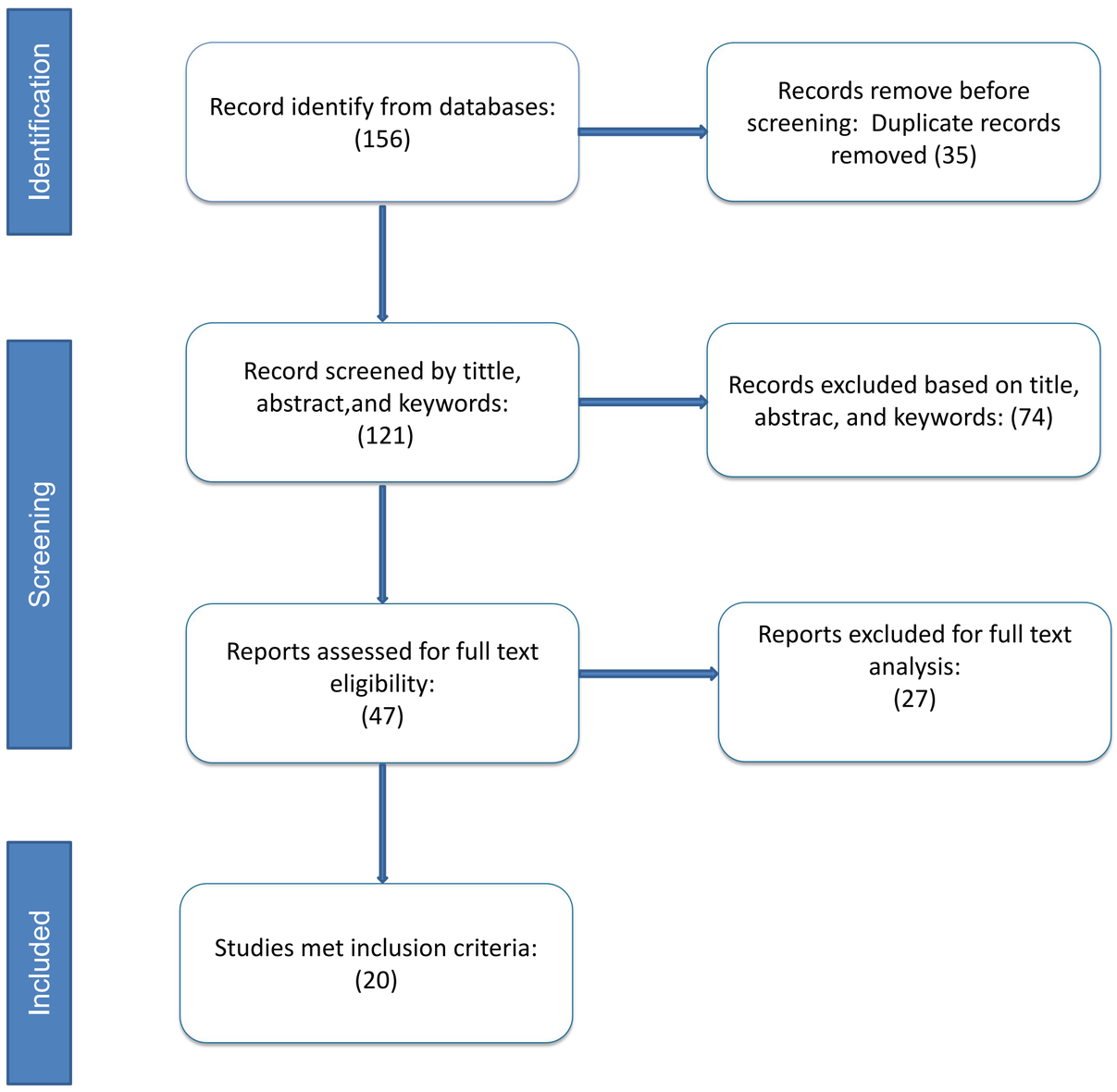

Fig.2: Flow chart for the methodology followed for the identification and selection of studies, according to the preferred reporting items for the systematic review (PRISMA).
Numbers within the bracket indicate the number of records

RESULTS & DISCUSSION

- The studies indicate that phytogenic feed additives containing bioactive compounds such as flavonoids, tannins, and alkaloids exhibit antimicrobial, antioxidant, and immunomodulatory effects, improving animal health and reducing disease incidence.
- Reduced antibiotic use correlates with lower levels of residues entering the environment via manure and runoff. Several studies also reported enhanced gut microbial balance and growth performance in animals supplemented with plant-based additives.

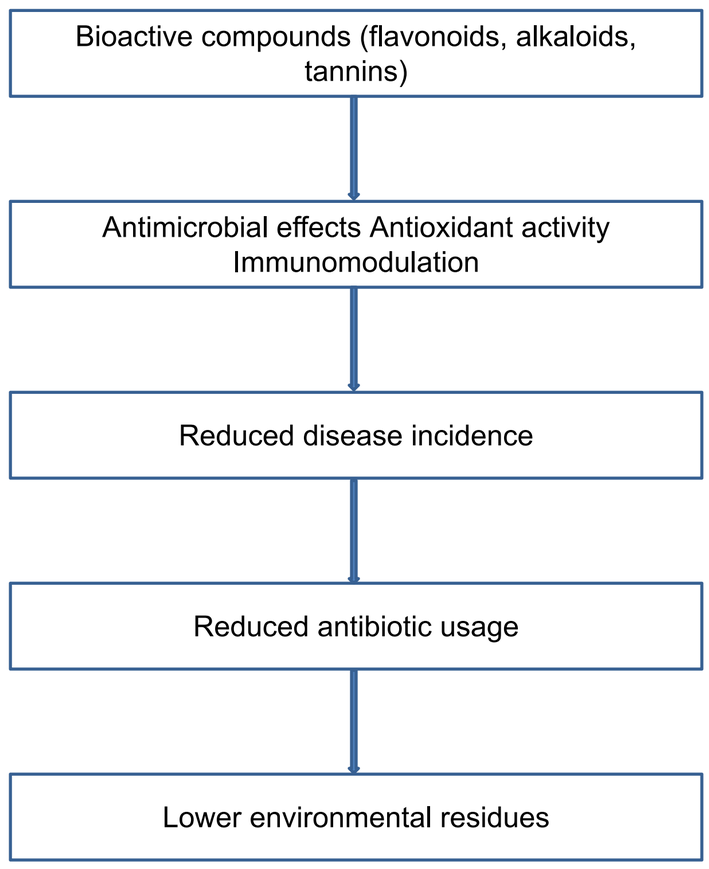

Fig.3: Flow chart showing how phytogenic feed additives improve animal health and performance, reduce antibiotic use, and consequently decrease environmental contamination from antibiotic residues.

CONCLUSION

Morinda lucida leaf powder shows promise as a sustainable feed additive capable of mitigating antibiotic use and environmental residues from livestock production. Its bioactive constituents contribute to improved animal health, which indirectly reduces reliance on therapeutic antibiotics and subsequently limits environmental contamination. However, current evidence remains largely experimental, and there is a need for standardized dosing strategies, in vivo validation across different livestock species, and long-term environmental impact assessments. Ultimately, the incorporation of Morinda lucida into animal nutrition systems could support environmentally friendly livestock production and contribute to global efforts in reducing antimicrobial resistance dissemination.

FUTURE WORK / REFERENCES

Future work should focus on conducting controlled in vivo and field-scale studies to determine the optimal inclusion levels of Morinda lucida leaf powder across different livestock species and validate its effectiveness under practical farming conditions. Long-term studies should assess the environmental impact of its application, especially its influence on antimicrobial resistance dynamics and the reduction of antibiotic residues in soil and water systems, as supported by reports from World Health Organization, Food and Agriculture Organization, and European Food Safety Authority.